

SYSTEM FOR FIXING ROTARY CUTTING DIES IN  
MACHINES FOR DIE CUTTING LAMINAR MATERIAL

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DESCRIPTION

Technical Field

PURPOSE

The present invention relates

- 10 ~~This descriptive report refers~~ to a system for  
fixing rotary cutting dies in machines for die cutting  
laminar material, the purpose of which lies in its  
configuration as a system that permits fixing rotary  
cutting dies on the cylinders or cutting die supports  
15 in machines for die cutting laminar material.

SCOPE

- This invention is applied within the industry  
20 dedicated to the manufacture of die cutting machines,  
especially machines for die cutting laminar material.

Background Art

HISTORY

- 25 In rotary cutting die machines, the material to  
be cut, for example cardboard for making boxes, is  
moved between a cutting die support cylinder and a  
counter-cutting die cylinder or anvil, also rotary, so  
that at each turn of the cylinders the cutting die  
30 falls on the counter-cutting die and makes a cut or  
warping on the cardboard.

- the problem of becoming  
To avoid ~~that~~ the cutting die ~~becomes~~ damaged by  
the blow, the surface of the counter-cutting die is  
35 provided with a polyurethane coating.

At present, the rotary cutting dies are fixed on the cutting die support by means of screws that are coupled to the corresponding screw holes made on the surface of the cutting die support cylinder.

This fixing system has the main inconvenience ~~that it is~~ <sup>of being</sup> excessively slow, as a considerable number of screws has to be placed.

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The statement made in the above paragraph confirms that the stopping time of the machine when a new cutting die has to be mounted is excessive and this affects the productivity of the rotary cutting die machine.

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### Summary

#### ~~DESCRIPTION~~ OF THE INVENTION

The system for fixing rotary cutting dies in machines for die cutting laminar material proposed by the invention is formed in itself as an obvious novelty that manages to resolve the above mentioned inconvenience and, furthermore, presents other advantages to be described later on.

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The system for fixing rotary cutting dies in machines for die cutting laminar material, ~~purpose of this invention,~~ includes fixing means between the cutting die and a cutting die support cylinder, where the fixing means has a number of bolts operated by a driving device.

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This characteristic permits rapid fixing of the rotary cutting die to the cutting die support cylinder, with the result that the shutdown time of the machine to change the cutting die is less than at

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present; thus,

~~present~~ improving the productivity of the cutting die machine.

The system of the invention also has the peculiarity that each of the working devices is housed inside a hollow body fixed to the cutting die support cylinder.

Because of

~~Thanks to~~ this characteristic the manufacturing costs of the cutting die machine are not overexpensive, in turn permitting that maintenance and mechanization of the machine are quick and easy.

Preferably, the working devices are also dynamic fluid cylinders that operate independently in the two halves of the cutting die support cylinder.

According to their performance, the dynamic fluid cylinders are pneumatic or hydraulic cylinders and <sup>it is</sup> also preferred <sup>that</sup> the working devices <sup>be</sup> dynamic fluid cylinders that operate independent of the two halves of the cutting die support cylinder.

Likewise, according to their performance, the dynamic fluid cylinders are pneumatic or hydraulic cylinders and it should be indicated that it is also preferred that the bolts are placed on the rotary cutting die in <sup>a grid pattern</sup> ~~an irregular~~ with the result that the bolts occupy the whole surface of the cutting die in a uniform way.

According to a performance, the system of the invention also includes screwed drill holes to fix the rotary cutting die to the cutting die support cylinder, placing these screwed drill holes to ensure fixing of the rotary cutting die to the cutting die

support cylinder in the event the system ~~purpose of~~  
~~this invention~~ is not used.

Preferably, the drill holes are also placed on  
 5 the cutting die support cylinder in ~~quincunxes,~~ *a grid pattern*  
 occupying the places that have not been used by the  
 bolts.

*Brief*  
 DESCRIPTION OF THE DRAWINGS

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To complement the description which follows and  
 in order to help with a better understanding of the  
 characteristics of the invention, this descriptive  
 report includes a set of drawings in which the  
 15 following is represented in an illustrative but not  
 limiting ~~way.~~ *way.*

Figure 1 shows an elevated section view of a  
 working device.

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Figure 2 shows a ~~view in perspective~~ *perspective view* of a cutting  
 die placed on a cutting die support cylinder.

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Figure 3 shows a ~~detail~~ *detailed view* of the centering system  
 of the cutting die on the cutting die support  
 cylinder.

Figure 4 shows a fixing hole of the cutting die.

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Figures 5, 6, 7 and 8 correspond to elevated  
 section views of the four working positions of the  
 working device relating to the system for fixing  
 rotary cutting dies in machined for die cutting  
 laminar material. ~~the purpose of this invention.~~

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# Detailed Description of the Drawings

## ~~PREFERRED PERFORMANCE OF THE INVENTION~~

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5 In view of these figures, it can be seen how the system for fixing rotary cutting dies in machines for die cutting laminar material is made up of rotary cutting dies (1) which are fixed to cutting die support cylinders (2) by means of a number of bolts  
10 (3) worked by a pneumatic cylinder (5).

The bolts (3) are fixed to the piston (6) of the pneumatic cylinder (5) by a screw nut (4) the head (7) of which has a larger diameter that fixes the cutting  
15 die (1) to the cutting die support cylinder (2).

The pneumatic cylinders (5) are housed inside two hollow bodies (8) and each of these hollow bodies (8) is fixed to the cutting die support cylinder (2) by  
20 means of four fixing screws (10).

As can be seen in figure 2, the bolts (3) are placed on cutting die support cylinders (2) and on the rotary cutting die (1) in <sup>a grid pattern</sup> ~~as in figure 2~~, so that they  
25 occupy the whole surface of the cutting die (1) in a uniform way.

In figure 3 it can be seen that, in order to center the cutting die (1) on the cutting die support  
30 cylinder (2), <sup>(2) there is</sup> ~~there is~~ a circumferential butt (19) and an axial <sup>stop</sup> ~~butt~~ (20) for centering the cutting die (1), <sup>while</sup> ~~whilst~~ the cutting die (1) has a centering guide (21).

The fixing system can also include screwed drill  
35 holes (22) to fix the rotary cutting die (1) to the cutting die support cylinder (2) and, in this case,

the screwed drill holes (22) are also placed on the cutting die support cylinder (2) and on the rotary cutting die (1) in ~~circumferences~~ <sup>a grid pattern</sup> occupying the places that have not been previously occupied by the bolts (3).

At the bottom of each pneumatic cylinder (5) there is an orifice (11) connected to a duct (12) for injecting pressurized air. In the event that the bolt (3) does not find any hole (15) in the cutting die (1) through which it can exit, the system of the invention has a hollow piston (6) that has a spring (14) inside which gives way and permits the bolt (3) to remain hidden inside the piston (6) and in a hollow (18) in the lid (9) of the pneumatic cylinder. This lid (9) is fixed to the cutting die (1) with the same screws (10) as the hollow body (8).

The holes (15) of the cutting die (1) have a ~~colica~~ <sup>bolt notch</sup> (16) provided with an adapter (17) in the shape of the head (7) of the bolt (3).

The different work stages of the working devices can be seen in figure 5.

The above mentioned stages of the working devices are as follows:

<sup>Stage. While</sup>  
First ~~stage~~ ~~Whilst~~ the pneumatic cylinder (figure 5) has no pressurized air, the spring (13) pushes the bolt (3) towards the inside of the hollow body (8). The cutting die (1) is placed on the cutting die support cylinder (2), butting against the circumferential ~~butt~~ <sup>stop</sup> (19) and the centering axial ~~butt~~ <sup>stop</sup> (20) of the cutting die support cylinder (2).

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Second ~~stage~~ <sup>stage. The</sup> The pneumatic cylinder, as shown in figures 6 and 7, receives the pressurized air through an orifice (1) made at the bottom of the pneumatic cylinder (5), connected to a duct (12), driving this pressurized air upwards to the piston (6) and, at the same, the bolt (3), thus overcoming the stress of the spring (13), as shown in figure 7.

10 In the hypothetical case that the outlet of the bolt (3) was obstructed, the pressurized air would continue to overcome the stress of the spring (13), thus maintaining the piston up, but the bolt (3) would remain hidden inside the piston (6), thus placing  
15 <sup>little</sup> ~~small~~ pressure produced by the spring (14) on the cutting die (1), as shown in figure 6.

Third stage - In this stage the cutting die (1) must be moved axially towards the position of the  
20 ~~bolts~~ <sup>bolt notch</sup> (16) and then ~~eliminate~~ the pressurized air, <sup>is eliminated</sup> from inside the pneumatic cylinder, ~~thus obtaining~~ <sup>Thus,</sup> that the spring (13) <sup>expands</sup> and in this way moves the piston (6) and the bolt (3) towards the inside of the cutting die support cylinder (2), thus fixing the head  
25 (7) of the bolt (3) and the cutting die (1) to the cutting die support cylinder (2), as shown in figure 8.

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